Course Outline

COURSE: WTRM 210   DIVISION: 50   ALSO LISTED AS: WTRM 110

TERM EFFECTIVE: Fall 2019   CURRICULUM APPROVAL DATE: 11/13/2018

SHORT TITLE: ADV WTR/WASTEWATER DIST MATH

LONG TITLE: Advanced Water/Wastewater/Distribution Math

<table>
<thead>
<tr>
<th>Units</th>
<th>Number of Weeks</th>
<th>Contact Hours/Week</th>
<th>Total Contact Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>18</td>
<td>Lecture: 3</td>
<td>Lecture: 54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lab: 0</td>
<td>Lab: 0</td>
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<tr>
<td></td>
<td></td>
<td>Other: 0</td>
<td>Other: 0</td>
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<tr>
<td></td>
<td></td>
<td>Total: 3</td>
<td>Total: 54</td>
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</tbody>
</table>

COURSE DESCRIPTION:

This course is a continuation of the Beginning Water/Wastewater Mathematics course WTRM 202 and covers advanced math concepts used in the Water/Wastewater/Distribution industry. Topics include industry standard formulas, conversion factors, MCRT, SVI, waste/return, horsepower, well drawdown, capacitance, yield, belt press cake/filtrate, SDI, sludge age, gas production and digestion rates. Previously listed as WTRM 110. ADVISORY: Math 205 Elementary Algebra and WTRM 202 Beginning Water/Wastewater Mathematics.

PREREQUISITES:

COREQUISITES:

CREDIT STATUS: D - Credit - Degree Applicable

GRADING MODES

L - Standard Letter Grade

REPEATABILITY: N - Course may not be repeated

SCHEDULE TYPES:

02 - Lecture and/or discussion
05 - Hybrid
72 - Dist. Ed Internet Delayed

STUDENT LEARNING OUTCOMES:
1. Apply mathematics such as addition, subtraction, multiplication, and division with whole numbers, decimals, and fractions used in the Water Industry: Trickling Filters and Rotating Biological Contactor math, Waste Treatment Ponds math, Sludge Production and Thickening calculations, and Sludge Dewatering and Disposal math.

Measure of assessment: Quizzes, Exams, Homework Problems
Year assessed, or planned year of assessment: 2017
Semester: Fall

2. Utilizing Industry Standard formula sheets and conversion factors: convert Cubic Feet to Gallons to Pounds and complete Activated Sludge, Chemical Dosage, Sludge Digestion, Laboratory, and Water Treatment Filter calculations.

Measure of assessment: Quizzes, Exams, Homework Problems
Year assessed, or planned year of assessment: 2017
Semester: Fall

CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS

Curriculum Approval Date: 11/13/2018

3 Hours
Content: Apply mathematics such as addition, subtraction, multiplication, and division with whole numbers, decimals, and fractions used in the Water Industry. Review basic math concepts covered in the beginning class.

Student Performance Objectives: Apply basic math concepts as they relate to Industry standard calculations.

3 Hours
Content: Review Industry Standard Formula Sheets used and provided when taking State Certification Exams. Identification of Conversion Factors used to convert Cubic Feet to Gallons to Pounds. Identify the Pounds Formula.

Student Performance Objectives: Identify formulas needed to successfully solve word problems. Manipulate conversion factors to convert Cubic Feet to Gallons to Pounds. Solve problems using the Pounds Formula.

4 Hours

Student Performance Objectives: Outline formulas needed to successfully solve word problems for unit process control.

6 Hours
Content: Activated Sludge Calculations. BOD and COD Loading, Solids Inventory, F/M Ratio, Sludge Age, SVI, MCRT, Return Sludge and Sludge Wasting Rates, Pumping Rates, and Oxidation Ditch Detention Time.

Student Performance Objectives: Identify formulas needed to successfully solve word problems for unit process control.

6 Hours

Student Performance Objectives: Outline formulas needed to successfully solve word problems for unit process control.

6 Hours
Content: Chemical Dosage Calculations. Chemical Feed Rate, Dose-Demand-Residual, Percent Strength of solution, Mixing Solutions of Different Strengths, Chemical Feed Pump Settings, Dry Chemical Feed Settings.

Student Performance Objectives: Identify formulas needed to successfully solve word problems for unit process control.

6 Hours

Student Performance Objectives: Explain formulas needed to successfully solve word problems for unit process control.
6 Hours


Student Performance Objectives: Identify formulas needed to successfully solve word problems for unit process control.
6 Hours


Performance Objectives: Outline formulas needed to successfully solve word problems for unit process control.
6 Hours


Student Performance Objectives: Identify formulas needed to successfully solve word problems for unit process control.
2 Hours

**METHODS OF INSTRUCTION:**
Lecture, Discussion, Multimedia, Demonstration

**METHODS OF EVALUATION:**
Writing assignments
Percent of total grade: 0.00 %
Course is primarily computational
Problem-solving assignments
Percent of total grade: 0.00 %
Percent range of total grade: 25 % to 45 % Homework Problems Quizzes Exams Other: Class Participation Skill demonstrations
Percent of total grade: 0.00 %
Percent range of total grade: 10 % to 25 % Class Performance/s Objective examinations
Percent of total grade: 0.00 %
Percent range of total grade: 30 % to 50 % Multiple Choice True/False Other: Math Computation

**OUT OF CLASS ASSIGNMENTS:**
Required Outside Hours: 78
Assignment Description: Out-of-Class Assignments: For each topic, students will review in class and text book examples to complete hand-out homework assignments.
Required Outside Hours: 26
Assignment Description: Study for quizzes and exams.

**REPRESENTATIVE TEXTBOOKS:**
Required Representative Textbooks
Recommended Representative Textbooks

11/7/2018 3

This is a standard text that is used in the water industry.
ISBN: 9781482224214
Reading Level of Text, Grade: 11th Verified by: Dana Young

Required Other Texts and Materials

**ARTICULATION and CERTIFICATE INFORMATION**

Associate Degree:
CSU GE:
IGETC:
CSU TRANSFER:
   Not Transferable
UC TRANSFER:
   Not Transferable

**SUPPLEMENTAL DATA:**
Basic Skills: N
Classification: Y
Noncredit Category: Y
Cooperative Education:
Program Status: 1 Program Applicable
Special Class Status: N
CAN:
CAN Sequence:
CSU Crosswalk Course Department:
CSU Crosswalk Course Number:
Prior to College Level: Y
Non Credit Enhanced Funding: N
Funding Agency Code: Y
In-Service: N
Occupational Course: C
Maximum Hours: 3
Minimum Hours: 3
Course Control Number: CCC000530892
Sports/Physical Education Course: N
Taxonomy of Program: 095800